WHAT IS CLAIMED IS:

1. A diffraction grating element, comprising:

a first medium having a refractive index of n_1;

a second medium arranged so as to be in contact with said first medium, said second medium having a refractive index of n_2 lower than that of said first medium; and

a diffraction grating provided at the interface between said first medium and said second medium,

wherein one of said first medium and said second medium is a solid, and the other thereof is a solid or a liquid, and

wherein, taking the period of said diffraction grating to be Λ, the height of said diffraction grating to be H, the duty ratio of the width of said first medium with respect to the period Λ in said diffraction grating to be f, and the normalized height expressed by (n_1/n_2-1) H/Λ to be H_{norm}, in a two-dimensional plane based on coordinate values (H_{norm}, f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.50, 0.32), the point (0.50, 0.75), the point (2.00, 0.90), the point (4.00, 0.90), the point (2.20, 0.76), the point (0.75, 0.32), and the point (0.50, 0.32), or within a region enclosed by linking in sequence, by means of line

segments, the point (2.25, 0.20), the point (2.25, 0.44), the point (2.75, 0.44), the point (2.75, 0.20), and the point (2.25, 0.20).

2. A diffraction grating element according to claim 1, wherein, in the two-dimensional plane based on coordinate values (H_{norm}, f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.60, 0.50), the point (0.60, 0.75), the point (2.00, 0.88), the point (2.40, 0.88), the point (1.50, 0.70), the point (1.10, 0.50), and the point (0.60, 0.50).

3. A diffraction grating element according to claim 1, wherein, in the two-dimensional plane based on coordinate values (H_{norm}, f), the normalized height H_{norm} and the duty ratio f lie within a region enclosed by linking in sequence, by means of line segments, the point (0.80, 0.62), the point (0.80, 0.65), the point (1.00, 0.75), the point (1.60, 0.82), the point (1.75, 0.82), the point (0.96, 0.60), and the point (0.80, 0.62).

4. A diffraction grating element according to claim 1, wherein the period Λ of said diffraction grating element is 1.46 µm or less.

5. A diffraction grating element according to claim 1, wherein the refractive index ratio (n_1/n_2)

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between said first medium and said second medium is 1.25 or more but 1.6 or less.

6. An optical module including a diffraction grating element according to claim 1, said optical module multiplexing or demultiplexing light by using said diffraction grating element.

7. An optical module according to claim 6, wherein the incident angle or the diffraction angle of the light in said second medium of said diffraction grating element is 60° or less.

8. An optical module according to claim 6, wherein the incident angle or the diffraction angle of the light in said second medium of said diffraction grating element is 25° or more but 35° or less.

9. An optical communications system including an optical module according to claim 6, said optical communications system transmitting signal light, and multiplexing or demultiplexing the signal light by using said optical module.

10. An optical communications system according to claim 9, wherein, in a signal wavelength band, a Bragg condition of said diffraction grating in said diffraction grating element included in said optical module is satisfied.